Letters to the Editor

Life Insurance Medical Research Fund Grants

On page 392 of *Science* for 25 October 1946, in an announcement of grants made by the Life Insurance Medical Research Fund, it was incorrectly stated that grants recently made in support of medical research at the Carnegie Institution of Washington, McGill University, and New York University had a total value of $633,591. This amount, $633,591, in fact represents the total value of all grants-in-aid made by the Life Insurance Medical Research Fund since its inception a year ago. In addition to this sum, fellowships with a total value of $55,800 have been awarded by this Fund in 1946.

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Myosin and Adenosinetriphosphatase in Muscular Activity

It is now generally assumed that the hydrolytic splitting of ATP furnishes the energy for muscular contraction or relaxation, and that this splitting is catalyzed by the contractile protein, myosin, itself, or by an enzyme closely associated with it.

Evidence obtained from recent experiments in this laboratory does not support this view.

It is found that the enzymatic activity of myosin or actomyosin, even under optimal conditions, is strongly inhibited by Mg-ions, and it can be shown that in muscle this inhibition is probably fully developed. Calculations show that the liberation of inorganic phosphate from ATP by myosin in dog muscle can take place with a speed of, at most, 0.003 mg. P/minute/mg. myosin.

From data in the literature (E. Lundsgaard. *Biochem. Z.*, 1930, 227, 51), on the other hand, it is calculated that the liberation of inorganic phosphate in contracting frog muscle takes place at a rate of at least 0.200 mg. P/minute/mg. myosin. Therefore, it is concluded that hydrolysis of ATP by myosin—ATPase— cannot be the source of the liberated inorganic P and of the energy for muscular activity.

On the other hand, it is found that ATP induces striking physical changes in myosin even under conditions which exclude hydrolysis of the ATP. It is not denied, therefore, that interactions between ATP and myosin (and ions) form the basic phenomena of muscular activity.

Detailed publications will be submitted to the *Journal of General Physiology.*

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The Possible Role of the Guppy, *Lebistes reticulatus*, on the Biological Control of *Schistosomiasis mansoni*

It has been observed that, in certain regions in Puerto Rico endemic for schistosomiasis and where numerous snails (*Australorbis glabratus*) could be recovered previously, these can no longer be found. Instead, numerous guppies of the species, *Lebistes reticulatus* (Peters), are seen in the water. Some of these were collected and brought to the laboratory. When placed in aquariums and other artificial containers, the guppies fed actively on the egg masses laid by the snails on rocks inside the aquariums, along the sides of the glass containers, on the vegetation, and on the snails' own shells. The fish preferred to attack those egg masses containing young snails just about ready to come out. On another experiment it was also observed that the guppies fed readily on cercariae shed by the snails.

According to S. D. Erdman in "Aquarium fishes in Puerto Rico" (*Rev. Agric. P.R.*, in press), *A. glabratus* is common where guppies are found. This investigator suggests that the absence of guppies in certain aquatic regions in Puerto Rico may be due to the fact that the *A. glabratus* is also absent. The egg masses of the snail may constitute essential food for the guppy for which the fish might have predilection.

Further investigations on this problem are being carried on. Guppies have been introduced in bodies of water containing snails, and the effect on the snail population is being constantly observed.

The author wishes to express his gratitude to B. Quiñonez Chacón and Felix Iñigo, from the Division of Fisheries, Department of Agriculture and Commerce, for the identification of the guppy and for their cooperation in this work.

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Reduction of Excess Acetylcholine in the Serum of Pernicious Anemia Patients by Treatment With Pteroyl Glutamic Acid, Liver Extract, or Ventriculin

Continued, twice-daily injections of acetylcholine into dogs was shown by us (*Science*, 1946, **104**, 37) to produce a hyperchromic anemia which responds to treatment with pteroyl glutamic acid or liver extract. Evidence was also presented which indicated that the therapeutic agents employed for producing remission of certain macrocytic anemias acted by increasing the cholinesterase activity of the organism. This letter is written to report some recently obtained observations on human patients with well-established diagnoses of pernicious anemia.

Serum acetylcholine concentrations were estimated on three patients in relapse and two patients in therapeutic remission. Our method of determining serum acetylcholine is being published elsewhere. It involves a biological assay utilizing the eserinized rectus abdominis muscle of the frog. In one case, the identification of the active substance in the serum as acetylcholine was made more certain by an experiment in which it was observed to cause a contraction of an isolated segment of rabbit intestine which was subsequently antagonized by atropine.

It was found that three pernicious anemia patients